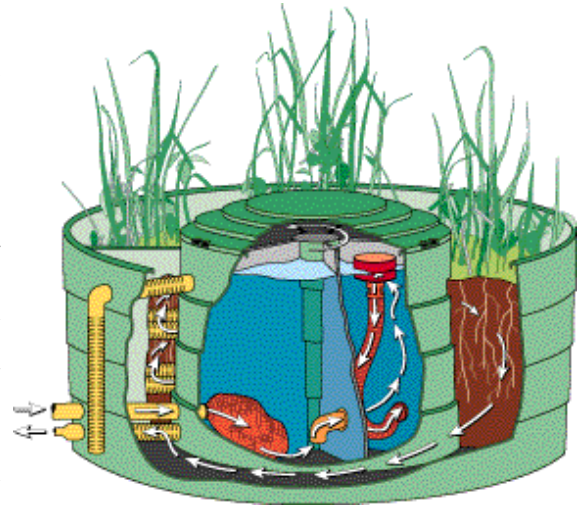


5.2. Retrofit Constructed Wetland Device

5.2.1. StormTreat™

General Description

The StormTreat™ System consists of a series of six sedimentation chambers and a constructed wetland, which are contained within a modular tank. Influent is piped into the sedimentation chambers where larger-diameter solids are removed. The internal sedimentation chambers contain a series of skimmers that decant the upper portions of the stormwater sediment basins, leaving behind more turbid lower waters. After moving through the internal chambers, the partially treated stormwater passes into the surrounding constructed wetland through a series of slotted PVC pipes.



The wetland is comprised of a gravel substrate planted with bulrushes and other appropriate wetland plants. StormTreat™ conveys stormwater into the subsurface of the wetland and through the root zone, where pollution attenuation occurs through such processes as filtration, adsorption, and biochemical reactions.

Site Considerations

The StormTreat™ System targets and removes solids, oil and greases, metals, and phosphorus. This system also provides microbial decomposition to treat stormwater runoff and associated pollutants. In addition, an outlet control valve can be closed to contain hazardous spills. StormTreat™ Systems have been installed in a variety of application, including both coastal and inland areas. Specific potential applications include:

- Commercial parking lots
- Industrial sites
- Town landings and marinas
- Transportation facilities
- Residential subdivisions

The StormTreat™ System is constructed of recycled polyethylene. Typically, 1-2 tanks are required per acre of impervious surface. The number of tanks is dependent on the level of treatment required, in-line detention capacity, and use of the optional infiltration feature, which provides an internal weir that directs treated water into the surrounding fill and soils once the water level in the wetland reaches three feet. The StormTreat™ storage capacity is 1390 gallons, with an average detention time of 5 days and an average discharge rate of 1-5 gallons per minute (gpm).

Installation

The StormTreat™ modular tank is 9.5 feet in diameter and is 4 feet in height. The low discharge rate (1-5 gallons per minute (gpm)) enables the system to be installed in any type of soil, however, because the system is gravity-dependent, the system requires an elevation change from the pavement surface to the

discharge point of at least 4 feet. The manufacturer recommends that a catch basin be placed upstream, prior to the StormTreat™ System in order to provide pretreatment and to trap larger diameter sediments.

Maintenance

Annual inspection is recommended to ensure that the system is operating effectively. At that time, the manhole should be opened and the burlap grit-screening bag covering the influent line should be removed and replaced. Filters should be removed, cleaned, and reinstalled. Sediment should be removed from the system via vacuum pump once every 3-5 years, depending on local soil characteristics and catch basin maintenance practices. The life expectancy of the StormTreat™ System is 20+ years upon proper maintenance.

Aesthetics, Community and Safety

Concerns regarding aesthetics, community support, and safety are highly site specific. For further information refer to Chapter 2, Decision Criteria.

Cost

The price per tank for the StormTreat™ System is approximately \$6,500. Additional materials required include gravel, piping, and wetland plants at an average of \$350 - \$400 per tank. Installation costs vary from \$100 - \$500 per tank for new construction and \$500 - \$1,500 per tank for retrofits. Average cost per acre of contributing impervious drainage area are \$7,500 - \$15,000.

Performance and Verification Ranking

Verification Ranking: ●●●●●

To date, eight independent storm events have been monitored during both winter and summer New England conditions. The Commonwealth of Massachusetts Strategic Envirotechnology Partnership (STEP) Program has verified the system performance.

Studies:

- *Treatment of Parking Lot Stormwater Using a StormTreat System.* University of Connecticut Department of Natural Resources Management and Engineering. 1997.
- *Progress Report Water Quality Monitoring at Elm Street Facility Kingston, Massachusetts.* StormTreat Systems, Inc. 1995.
- The Massachusetts Strategic Envirotechnology Partnership (STEP) Program. September 1997.

Installation Contact

Location: Crystal Lake, Manchester, NH
 Contact: Art Grindle, Manchester Urban Pond Restoration Coordinator
 City of Manchester
 One City Hall Plaza
 Manchester, NH 03101
 Telephone: (603) 624-6450
 Email: agrindle@ci.manchester.nh.us

StormTreat™ Systems have also been installed at the following locations:

- GTE Laboratores, Waltham, MA
- Housing Development, Auburn, MA
- Mill Pond, Barnstable, MA
- New England Sealcoating, Hingham, MA
- Residential Road, Jones River, Kingston, MA
- Residential Road, Rowley, MA
- Shell fishing area, Gloucester, MA
- Town Park, Ipswich, MA
- Rite-Aid, Augusta, ME
- Rite-Aid, Manchester, ME

Manufacturer

Company: StormTreat Systems, Inc.
Address: 124 Route 6A
Sandwich, MA 02563
Telephone: (508) 833-1033 or (877)-STRMH2O (toll free)
787-6426
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